

AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An injection valve for an internal combustion engine comprising:

a control valve, which is activated ~~espeeially~~ electromagnetically and, by means of using a valve actuator incorporating a valve rod, selectively alternatively closes off or and opens up an opening for the passages of a fluid,

the valve rod of the valve actuator having at one end which is assigned to an actuator sealing surface cooperating with a sealing surface of the passage opening to selectively close and open the passage opening and, by these means, controls to control the pressure in a control pressure space, ~~which is connected~~ with to the passage opening,

~~the valve actuator further, in addition to an actuator sealing surface, which acts together with the sealing surface of the opening for the passage of fluid, having an actuator stop surface, larger than the sealing surface, which is disposed at a distance from the actuator sealing surface at another end of the valve rod to abut an opposing stop surface,~~

~~the valve actuator having a valve rod which has a length, the having a length being greater by an excess length in relation to than a distance between~~

the passage opening sealing surface and the opposing stop surface of the control valve actuator,

wherein, during a closing movement of the valve actuator, the excess length is taken up by an elastic deformation of the valve rod, the excess length being selected to provide a desired sealing function at the actuator sealing surface and damping function at the actuator stop surface.

2. (Previously Presented) The injection valve of claim 1, wherein the stop surface of the actuator is significantly larger than the sealing surface.

3. (Currently Amended) The injection valve of claim 1, wherein the valve actuator ~~is formed with~~ incorporates one of a one-part ~~or~~ and a two-part valve rod.

4. (Currently Amended) The injection valve of claim 3, wherein the valve actuator contains a valve body, which touches ~~the~~ a front face of the valve rod and contains the sealing surface of the actuator.

5. (Currently Amended) The injection valve of claim 4, wherein ~~the~~ a valve body is constructed as a sphere, which interacts with the opening for the passage of fluid, forming a seal.

6. (Currently Amended) The injection valve of claim 3, wherein the sealing surface of the actuator is ~~the~~ a front face of the valve rod ~~formed by the~~ valve actuator.

7. (Currently Amended) The injection valve of claim 3, wherein the valve actuator is essentially mushroom-shaped, ~~the a~~ stem of the mushroom forming the valve rod and the actuator stop surface ~~of the actuator~~ being an annular collar, concentrically surrounding the valve rod in ~~the a cap~~ region of the mushroom cap.

8. (Currently Amended) The injection valve of claim 3, wherein the valve actuator is divided ~~in~~ by a dividing joint into an actuator stop, having the stop surface of the actuator, and a valve rod, ~~which is~~ in operative connection with the sealing surface and the stop of the actuator.

9. (Currently Amended) The injection valve of claim 3, wherein the actuator stop is essentially mushroom-shaped, the stop surface of the actuator being an end face thereof, contacting the valve rod in ~~the a foot~~ region ~~of the foot~~ of the mushroom.

10. (Previously Presented) The injection valve of claim 3, wherein the valve rod is guided axially movably in at least one guide bushing.

11. (Previously Presented) The injection valve of claim 10, wherein a guide bushing is disposed at a small distance from the sealing surface of the actuator.

12. (Currently Amended) The injection valve of claim 3, wherein the length of the valve rod is ~~a~~ an integer multiple of its diameter.

13. (Previously Presented) The injection valve of claim 1, wherein the sealing surface is formed in the end face of a disk-shaped insert part and adjoins the control pressure space on the side averted from the sealing surface.

14. (Previously Presented) The injection valve of claim 13, wherein the insert part is formed in two parts with a first part, which contains an opening for the passage of fluid and a discharge choke and a second part at the control pressure space side, with a borehole, which connects the control pressure space with an opening for the passage of fluid.

15. (Previously Presented) The injection valve of claim 14, wherein the second part contains an inlet choke, which is connected with the borehole.

16. (Currently Amended) An injection valve for an internal combustion engine comprising:

a control valve, which is activated especially electromagnetically and, by means of using a valve actuator incorporating a valve rod, selectively alternatively closes off or and opens up an opening for the passages of a fluid, the valve rod of the valve actuator having at one end which is assigned to an actuator sealing surface cooperating with a sealing surface of the passage opening, to selectively close and open the passage opening and, by these means, controls to control the pressure in a control pressure space, which is connected with to the passage opening,

the valve actuator, ~~in addition to an actuator sealing surface, which acts~~
~~together with the sealing surface of the opening for the passage of fluid, further~~
having an actuator stop surface, larger than the sealing surface, which is
disposed at a distance from the actuator sealing surface at another end of the
valve rod to abut an opposing stop surface,

~~the valve actuator comprising a valve rod which has a length, the having a~~
~~length being greater by an excess length than a distance between the passage~~
~~opening sealing surface and the opposing stop surface of the control valve~~
~~actuator,~~

wherein, during a closing movement of the valve actuator, the excess length is taken up by an elastic deformation of the valve rod, and

wherein the sealing surface is formed in the end face of a disk-shaped insert part and adjoins the control pressure space on the side averted from the sealing surface, and the insert part contains an inlet choke in addition to an outlet choke.

17. (Previously Presented) The injection valve of claim 13, wherein the control pressure space is connected with an inlet choke.

18. (Previously Presented) The injection valve of claim 13, wherein the rear end of the valve needle, averted from the nozzle needle seat surface, lies in the control pressure space.

19. (Previously Presented) The injection valve of claim 18, wherein the insert part forms a stop for the valve needle.

20. (Currently Amended) The injection valve of claim 13, wherein the insert part, a centering and holding clamp and a sleeve, in which ~~at least one the~~ valve rod and at least one guide bushing with the actuator stop surface is taken up, form a structural unit, which can be separately pre-adjusted ~~by itself in relation with respect~~ to the protrusion of the valve rod.

21. (Currently Amended) An injection valve for an internal combustion engine comprising:

an opening having a sealing surface;

a stop displaced a distance from the opening having an opposing stop surface; and

an electromagnetical control valve including:

the valve actuator including:

an actuator sealing surface that engages the sealing surface of the opening when the valve actuator is at the closing position,

an actuator stop surface that engages the opposing stop surface when the valve actuator is at the closing position, and

a valve rod ~~disposed between~~ defining at one end the actuator sealing surface and at another end the actuator stop surface,

wherein when the valve actuator is at the closing position, the valve rod is compressed to a length that is shorter by an excess length than a length of the valve rod when the valve actuator is at the opening position, wherein the excess length is selected to provide a desired sealing function at the actuator sealing surface and damping function at the actuator stop surface.

22. (Previously Presented) The injection valve of claim 21, wherein the stop surface of the actuator is significantly larger than the sealing surface.

23. (Currently Amended) The injection valve of claim 21, wherein the valve actuator is formed with one of a one-part or and a two-part valve rod.

24. (Previously Presented) The injection valve of claim 23, wherein the valve actuator contains a valve body, which is positioned at a front face of the valve rod and contains the sealing surface of the actuator.

25. (Previously Presented) The injection valve of claim 24, wherein the valve body has the configuration of a sphere.

26. (Previously Presented) The injection valve of claim 23, wherein the sealing surface of the valve actuator is a front face of the valve rod.

27. (Previously Presented) The injection valve of claim 23, wherein the valve rod is axially movably guided in a guide bushing.

28. (Previously Presented) The injection valve of claim 27, wherein a guide bushing is disposed near the actuator sealing surface.

29. (Currently Amended) The injection valve of claim 23, wherein the length of the valve rod is ~~a~~ an integer multiple of its diameter.

30. (Previously Presented) The injection valve of claim 21 further comprising a disk-shaped insert having a first end face that includes the sealing surface, and a second end face adjoining a control pressure space.

31. (Previously Presented) The injection valve of claim 30, wherein the insert has a first part, which includes the opening and a discharge choke, and a second part, which includes a borehole that connects the control pressure space with the opening.

32. (Previously Presented) The injection valve of claim 31, wherein the second part of the insert includes an inlet choke, which is connected with the borehole.

33. (Previously Presented) The injection valve of claim 30, wherein the insert includes an inlet choke.

34. (Previously Presented) The injection valve of claim 30, wherein the control pressure space is connected to the inlet choke.

35. (Previously Presented) The injection valve of claim 30 comprising a valve needle having an end disposed in the control pressure space.

36. (Previously Presented) The injection valve of claim 35, wherein the insert part forms a stop for the valve needle.

37. (Currently Amended) The injection valve of claim 30 further comprising a centering and holding clamp and a sleeve, wherein the insert part, the centering and holding clamp and the sleeve, in which the valve rod and the guide bushing that includes the actuator stop surface are placed, form a structural unit, which can be pre-adjusted ~~in relation with respect~~ to a protrusion of the valve rod.